



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,613	04/08/2004	Kalin Spariosu	PD-03W133	8186
7590 03/02/2007 RAYTHEON COMPANY Patent Docket Administration Bldg. E04, M/S N119 2000 E. El Segundo Blvd. El Segundo, CA 90245-0902			EXAMINER NGUYEN, TUAN N	
			ART UNIT	PAPER NUMBER
			2828	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/02/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/820,613

Applicant(s)

SPARIOSU ET AL.

Examiner

Tuan N. Nguyen

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23 is/are allowed.
- 6) ☒ Claim(s) 1-22 and 24-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 04/08/2004.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

Art Unit: 2828

Response to RCE Amendment

1. In respond to applicant's amendment filed 11/15/2006, claims 1, 3, 7, 12, 15, 23, 24 have been amended, and claims 25-31 have been added. Claims 1-31 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or non-obviousness.
3. Claims 1-3, 7,8, 12, 13, 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hemmati (US 5408480).

With respect to claims 1, 7, 8, 12, 13 Hemmati '480 shows and discloses a laser comprising: an active medium disposed within a resonator (*Fig 2: 21 laser medium within resonator mirrors 24, 25*); a material operationally coupled to said medium and having a transmittance property that varies in response to incident energy (*Fig 2: 23 Q switch material coupled to medium with transmittance varies in respond to the laser*

Art Unit: 2828

input); and means disposed external to said medium for applying energy to said material (*Fig 2: 26 diode laser mean external to medium applying energy to Q switch*). The claim further requires that said means having a response time that is shorter than round trip delay time of light within said resonator. Hemmati '480 did not discretely disclose the respond time is shorter than round trip delay light within the resonator, however Hemmati '480 shows and discloses in (*Fig 2: 27 low current control source controlling laser diode "26" output that switch/trigger the Q switch 23 output at a desire wavelength*) and (*Fig 1: 14 switch control driver controlling Q switch output*); it is inherently obvious and within one skill in the art to recognize, the energy from the external means response time is shorter then its round trip delay within the resonator because of additional time spent within the resonator. In addition, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, in this case the control source can vary from higher to lower frequency such that when a laser oscillating longitudinal is equal to an integral multiple of the transverse oscillation, then the wavelengths will phase lock. Since claims 12, 13 recites the same or identical elements/limitations it is inherent to use patents '480 to recite the method of lasing, product by process.

With respect to claims 2, 27 Hemmati '480 discloses wherein said material is a saturable absorber (*Col 1: 60 passive Q switch – saturable absorber*).

With respect to claim 3, Hemmati '480 shows and discloses means for applying energy includes a diode laser adapted to deliver an optical pulse of duration shorter than a

Art Unit: 2828

round trip delay time of light within said resonator (*Fig 2: 26 diode laser mean external to medium applying energy to Q switch*) in (*Fig 2: 27 low current control source controlling laser diode "26" output that switch/trigger the Q switch 23 output at a desire wavelength*) and (*Fig 1: 14 switch control driver controlling Q switch output*).

With respect to claims 26, Hemmati '480 shows and discloses a laser comprising: an active medium disposed within a resonator (*Fig 2: 21 laser medium within resonator mirrors 24, 25*); a material operationally coupled to said medium and having a transmittance property that varies in response to incident energy (*Col 1: 60 passive Q switch –saturable absorber, and inherent varies in response to incident energy such as absorbing*); and means disposed external to said medium for applying energy to said material, said means having a response time that is shorter than or equal to a round trip delay time of light w/thin said resonator (*Fig 2: 26 diode laser mean external to medium applying energy to Q switch;*). It is inherently obvious and within one skill in the art to recognize, the energy from the external means response time is shorter then its round trip delay within the resonator because the wavelength spent more time within the resonator.

4. Claims 4-6, 9-11, 14-22, 24, 25, 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hemmati (US 5408480) in view of Halmos et al. (US 2002/0051470).

Art Unit: 2828

With respect to claims 4, 5, 9, 10, 29, 30 Hemmati '480 discloses the above. The claims further require the means includes focusing optics or dichroic beamsplitter disposed between said diode laser and said absorber material. It has been held that omission of an element in a combination where the remaining elements perform the same functions involves only routine skill in the art, in this case a mirror/prism/collimating lens or dichroic beam splitter can be used to directing/focusing or tuning the beam wavelength output from the diode laser prior to shining on the saturable absorber (SA). Halmos et al. ('470) shows the use of splitter and focusing optics in the mode-lock system (Fig 1a: 130, 140, 150, 170, POLARIZER, switching means). It would have been obvious to one of ordinary skill in the art to provide Hemmati '480 the element as taught or suggested by Halmos et al. ('470) to directing/focusing/or splitting the beam wavelength output.

With respect to claim 6, 11, 14, 31 Halmos et al. ('470) discloses and shows a quasi-monolithic diode laser assembly ring disposed external to said medium for applying energy the laser structure (*Title: a Laser Q-Switched and Mode-locked*) (Fig 1a, 2a: 120, 150, 140 quasi-monolithic diode laser assembly ring external to said medium).

With respect to claims 15, 24 Halmos et al. ('470) disclose a dual mode laser comprising (ABSTRACT)(Sections [0008; 0009]: an active medium disposed within a resonator cavity (Fig 1a: 100 active medium); means for changing the length of said cavity from a first length in a first mode of operation to a second length in a second mode of operation (Fig 1a, 2a: 130, 140, 160, 170, 190)(Section [0024-0028] means changing cavity length with first mode-locked and second Q-switching); a material operationally

Art Unit: 2828

coupled to said medium and having a transmittance property that varies in response to incident energy (*Fig 1a: 150 Q-switch material varies in response to incident energy*);

With respect to claim 16, Hemmati '480 discloses wherein said material is a saturable absorber (*Col 1: 60 passive Q switch – saturable absorber*).

With respect to claim 17, Hemmati '480 shows and discloses means for applying energy includes a diode laser (*Fig 2: 26 diode laser mean external to medium applying energy to Q switch*).

With respect to claim 18 Halmos et al. ('470) shows and discloses an outcoupler and a first highly reflective mirror arranged to provide said resonator cavity therebetween (*Fig 1a: 110, 190 OUTPUT COUPLER, high reflective mirror provide resonant cavity*).

With respect to claim 19 Halmos et al. ('470) shows a polarizer disposed between said outcoupler and said mirror (*Fig 1a: 140 POLARIZER*).

With respect to claim 20 Halmos et al. ('470) shows means for changing the length of said cavity includes a polarization rotator disposed in optical alignment with said medium and said polarizer (*Fig 1a: POLARIZER, 130 rotator means to change length of cavity*)(Section [0008-0009]).

Art Unit: 2828

With respect to claim 21 Halmos et al. ('470) shows a second highly reflective mirror in operational alignment with said polarizer (Fig 1a: 120 HR high reflector aligned with polarizer 140).

With respect to claim 22 Halmos et al. ('470) discloses wherein said first mode is a Q-switched mode and said second mode is a mode-locked mode (*Section [0008]*).

With respect to claims 25, Hemmati '480 shows and discloses a laser comprising: an active medium disposed within a resonator (*Fig 2: 21 laser medium within resonator mirrors 24, 25*), a saturable absorber operationally coupled to said medium and having a transmittance property that varies in response to incident energy (*Col 1: 60 passive Q switch –saturable absorber, and inherent varies in response to incident energy such as absorbing*) and means disposed external to said medium for applying energy to said saturable absorber, said means having a response time that is shorter than or equal to a round trip delay time of light within said resonator (*Fig 2: 27 low current control source controlling laser diode "26" output that switch/trigger the Q switch 23 output at a desire wavelength*) and (*Fig 1: 14 switch control driver controlling Q switch output*). The claim further requires said means for applying energy being a quasi-monolithic diode laser assembly ring including: a diode laser adapted to deliver an optic pulse of duration shorter than or equal to said round trip delay time of light within said resonator, *focusing optics* disposed between said diode laser and said material, and a dichroic beamsplitter for directing said energy to said absorber material. Hemmati '480 did not discreetly disclose the above elements,

Art Unit: 2828

however Halmos et al. '470 shows and discloses the use of splitter and focusing optics in a Q-switch and mode-lock system, including a quasi-monolithic diode laser assembly ring disposed external to said medium for applying energy to the laser structure (*Fig 1a: 130, 140, 150, 170, POLARIZER, switching means*) (*Title: a Laser Q-Switched and Mode-locked*) (*Fig 1a, 2a: 120, 150, 140 quasi-monolithic diode laser assembly ring external to said medium*). It would have been obvious to one of ordinary skill in the art to provide Hemmati '480 the element as taught or suggested by Halmos et al. ('470) to directing/focusing/or splitting the beam wavelength output to deliver an optic pulse of duration shorter than or equal to said round trip delay time of light within said resonator

With respect to claim 28 wherein said means for applying energy includes a diode laser adapted to deliver an optical pulse of duration shorter than or equal to said round trip delay time of light within said resonator (*Fig 2: 22, 26*).

Allowable Subject Matter

5. The following is an examiner's statement of reasons for allowance - Applicant's remark response filed on 11/14/2006 has been considered, with respect to claim 23 the references of the record fail to teach or suggest a dual mode laser comprising:

Claim 23:

An output coupler with active medium having a saturable absorber coupled to the gain medium disposed within a first and second reflective mirrors, where the output coupler and first mirror defined a first mode of operation and the second mirror in a second mode of operation, where a polarizer and a polarization rotator aligned with the

Art Unit: 2828

outcoupler and changing the beam reflected, and a laser diode disposed external to the gain medium applying energy with pulse duration shorter than round trip delay within the resonator in the first mode of operation and mode-locking in the second mode of operation.

Response to Argument/

6. Applicant's remarks filed on 11/15/2006 have been fully considered but they are not persuasive. On pages 8-12, the applicant the applicant pointing out the references fail to point out " means disposed external to said medium for applying energy to said material, said means having a response time that is shorter than or equal to a round trip delay time of light within said resonator" and further shows what disclosed in the background of the application.

The examiner wants to pointing out the - not only the claims consist of a single means and insufficient structure of performing the functional relationship as disclosed. Even though the reference did not discreetly disclose the functional language as presented in the claim, the functional language is not patentable. In addition, the claims were appropriately rejected under 103. **The examiner read the claims given their broadest reasonable interpretation consistent with the specification. However, it is not proper to read limitations appearing in the specification into the claim when these limitations are not recited in the claim.** See *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (fed. Cir. 1994); *Intervet America Inc. v. Kee-Vet Lab. Inc.*, 887 F2d 1050, 1053, 12 USPQ2d 1474, 1476 (Fed. Cir. 1989).

Art Unit: 2828

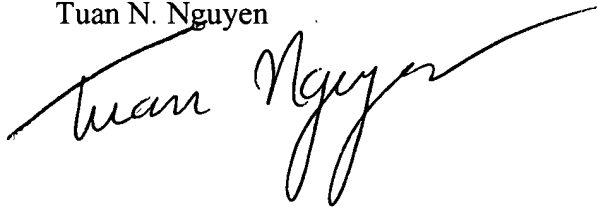
Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey Minsun can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan N. Nguyen


**MINSUN OH HARVEY
PRIMARY EXAMINER**